



# AirForce™ Ionizing Blow-off Gun

Model 6115



## Instruction Manual



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# 1 Description

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The Model 6115 AirForce Ionizing Blow-off Gun provides efficient ionization and effectively removes particle contamination, even on the most static-sensitive of products. Patented IsoStat® technology ensures that surface charges are controlled with constantly balanced ionization. The AirForce never needs calibration and requires very little maintenance.

Compact and lightweight, the AirForce console can be mounted anywhere on the workstation for easy access. The console connects to any supply of clean dry air or nitrogen and an internal disposable filter collects particles from the supply. The console, gun, and air hose are static-dissipative and ESD-safe. An extremely low EMI level ensures that the AirForce won't interfere with other electronic equipment or operations.

# 2 Performance and Power Requirements

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## 2.1 Performance

The AirForce reduces a static charge of  $\pm 1000$  V down to 100 V in less than one second at a distance of six inches (30-psi inlet pressure). (Ref. EOS/ESD Standard 3.1. STM for test procedure.) Balance is within  $\pm 30$  V of zero at a distance of six inches.

## 2.2 Power Requirements

The 6115 AirForce console requires a 24 VAC power source, which can be provided by wall transformers. Ion offers three transformers for use with this product: the 14-1306 (100VAC input), 14-1310 (117VAC input), and 14-1523 (230VAC input). Check the Ion part number on the AirForce console to ensure that the correct power source is used. Refer to Table 1.

<b>Console Part #</b>	<b>Transformer Part #</b>	<b>Power Required</b>
91-6115-NXFMR	14-1306	100 VAC
91-6115-NXFMR	14-1310	117 VAC
91-6115C-NXFMR	14-1523	230 VAC

Table 1. Power Source Requirements

To ensure correct usage and continued performance of the wall transformer, please note the following:

- The transformer should not be operated beyond the specified electrical limit as described in the **Specifications** section of this manual.
- Damage caused to the transformer from operation in an environment that exceeds the specified limits will void the warranty.

## 2.3 Clean Dry Air Requirements

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**CAUTION**

Failure to use clean dry air or nitrogen may result in damage to the AirForce that is not covered under warranty.

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The air supply must be clean dry air or nitrogen supplied by a delivery system that utilizes a refrigerated dryer or equivalent water removal to achieve a limit of about 550 ppm water vapor at 35°F (1.66°C) Dew Point. To prevent particles from entering the console, a 2 micron coalescing filter or better is recommended upstream of the gun console.

An adequate filter that can be recommended for the inlet of the AirForce Gun would be a Finite Filter Grade 10 Media Specification. This provides a 95% coalescing efficiency for aerosols with a 0.7 micron (and greater) particle retention. This removes gross amounts of particles, water and or oil and aerosols.

A Grade 6 Media provides 99.98% efficiency when almost total removal of liquid aerosols and particles are required in all pressure ranges down to 0.01 microns. This would offer the highest protection at the gun without need of frequent change. Fine filters need to be changed more often.

# 3 Installation

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## 3.1 Mounting

Choose a location that will be convenient to the work area and the air supply. The console takes up very little space and is adaptable to a variety of permanent or temporary installations. To minimize bends in the gun hose, orient the console so that the open end points toward the work area and the male connector points toward the air supply.

Prior to mounting, plug one end of the supplied 10-foot phone cable into the jack on the back of the console. Lay the cable inside the groove in the console. Plug the other end of the phone jack into the unplugged wall transformer.

The console may be mounted in a temporary or permanent state, depending on your application and environmental needs. The following instructions describe both mounting methods.

### *Permanent Mounting*

1. Attach the supplied mounting plate to the threaded holes on the back of the console, using the supplied screws. See Figure 1.
2. Attach the plate to a flat surface, such as a wall or back of a work bench, using suitable screws and fasteners. When mounting to a hollow wall be sure to use #8 screws and 3/4" length anchors as a minimum.

See **Figure 1. Permanent Mounting.**

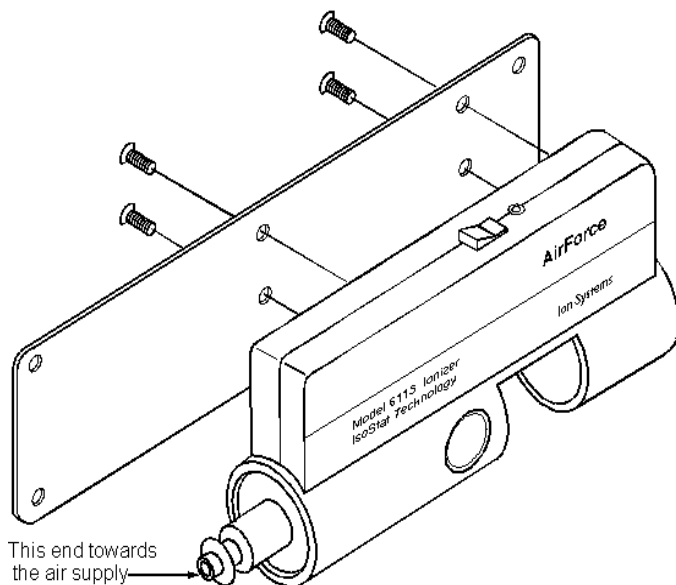


Figure 1. Permanent Mounting

## *Temporary Mounting*

Units may be mounted with Velcro or 3M Dual Lock™ strips (available from Ion). Attach the console to a flat surface.

## *Mounting to an Air Supply*

When an air supply is close to the work area and fitted with a standard industrial interchange quick coupling, you may attach the console to the air supply fitting directly. If necessary, use a prefilter as defined previously in 2.3 Clean Dry Air Requirements.



## 3.2 Assembling the Components

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**CAUTION** ! Protect the hose from sharp objects, abrasion, and high temperatures. Do not pull or pinch the hose while assembling the components.

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1. **Insert the filter into the end of the flexible air hose.** Press the metal filter release tab at the end of the hose until it locks into place. Insert the large end of the filter into the opening until it is firmly seated. See Figure 2. Inserting the Air Filter.

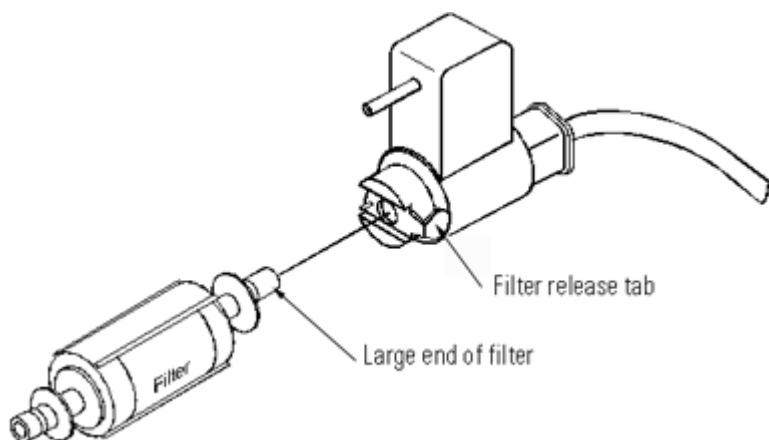


Figure 2. Inserting the Air Filter

2. **Connect the hose and filter to the console.** Press the filter release button on the front of the console to lock it down. Push the fitting containing the filter all the way into the opening in the console until it latches with a click. It fits only in the correct orientation. The small plastic fitting on the end of the filter must align with the metal guide coupling in the console. You may have to wiggle the filter slightly while inserting it. See Figure 3. Connecting the Hose and Filter.

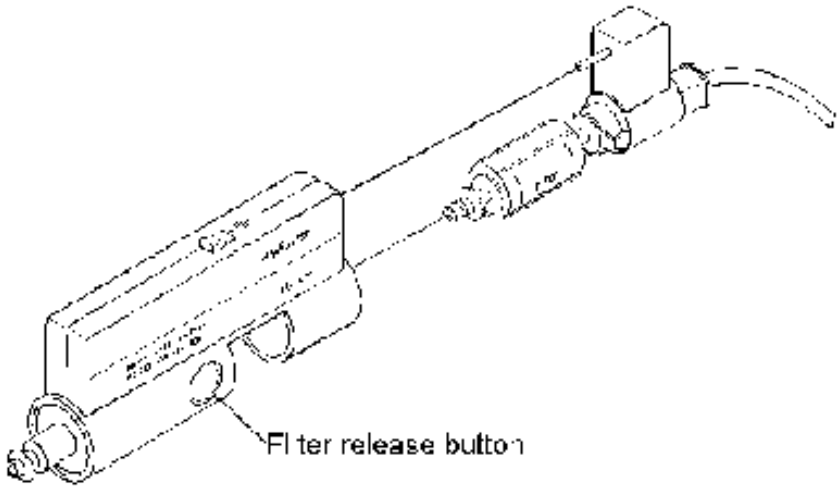


Figure 3. Connecting the Hose and Filter

- 3. Connect the male fitting on the console to the air supply.** The console is designed for a standard industrial interchange quick coupling. You can attach the console directly to the air supply or attach it using a hose (not supplied). If necessary, use a prefilter as defined in section 2.3 Clean Dry Air Requirements.
- 4. Attach the foot switch to the console (optional).** If you have purchased the optional foot switch, plug its cable into the jack on top of the console (next to the power switch).

# 4 Operation

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## *Before Turning the Unit On*

With the power switch on top of the console off, insert the 24 VAC output of the wall transformer into the plug on the top of the console. Ensure the following:

- The correct wall transformer is used. **The use of an improper wall transformer may result in damage to the unit.** Refer to section 2 **Performance and Power Requirements** for additional information.
- The wall transformer is inserted into a properly grounded AC receptacle.
- If the console is not attached to a surface, the power cord is secured so that it cannot accidentally pull the console and gun off the work bench.

For safety and the most efficient ionization, set the pressure regulator on your air or nitrogen supply between 20 and 65 psi. Discharge times vary depending on air pressure.

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### **CAUTION**



Pressures of 30-40 psi are commonly used for decontaminating surfaces. OSHA regulations recommend limiting hand-held air blow-off devices to maximum pressures of 30 psi. The hose is rated at 65 psi at temperatures up to 75°F (24°C), and the rating decreases at higher temperatures. When using high pressures, consider the ambient room temperature as well as heat from surrounding equipment.

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## *Power Up and Use*

Turn the Power Switch on the console to on. The green LED on the console should illuminate.

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**CAUTION**

Do not turn the Power Switch on the console to ON at the same time that the gun trigger is pressed.

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Hold the gun approximately six inches from the surface you want to blow-off and discharge. Aim the gun and press the trigger to blow ionized air. The green LED on the back of the gun lights up while you press the trigger. **Typically, static electricity is discharged within one second.** Release the trigger when the surface is clean.

If the optional foot switch is installed, you can use either the foot switch or the trigger.

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**CAUTION**

Do not use this equipment with pressure above 65 psi.

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## *Storage*

If the gun won't be used for some time, turn off the power switch on the console. Use the included hook to hang the gun out of the way but within reach.

# 5 Maintenance

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The AirForce requires very little maintenance. Occasional cleaning of the case and emitter points, and periodic replacement of the air filter, is all that is required. **Always be sure to protect all components from liquids and corrosive chemicals.** Carefully follow these maintenance instructions.

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**CAUTION**

Disconnect power and air supplies before cleaning or replacing components.

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## Recommended Cleaning Materials:

- Cleanroom-compatible cleaning cloths
- Cleanroom-compatible cloth swabs (polyester cloth is recommended)
- Cleaning solution of 50% IPA (electronic-grade isopropanol alcohol)/50% de-ionized water or Ion's Emitter Point Cleaner (#22-1000)

## 5.1 Cleaning the Components

1. Turn off the console and disconnect it from its power and air supply sources.
2. Using a cloth moistened with the IPA solution, wipe the exterior surfaces of the console and gun to remove any dirt or dust that may have collected.
3. Using a swab moistened with the IPA solution, gently clean the emitter points on the gun. Extremely dirty points increase the

time needed to discharge static and can affect the ionization balance.

## 5.2 Replacing the Air Filter

Ion recommends changing the filter every 3 months or when it begins to look dirty.

1. Turn power off at the console and disconnect the console from the air supply.
2. Hold down the filter release button on the side of the console.
3. Remove the hose and filter from the console by pulling the textured rubber plug where the hose emerges from the console. Rocking the plug back and forth can help loosen the filter. **Do not pull the hose itself.**
4. Remove the filter from the hose fitting by depressing the metal release tab on the fitting and pulling off the filter.
5. Follow the directions in section 3.2 **Assembling the Components** to install the new air filter.

## 5.3 Replacing the Emitter Points

The emitter points usually last the life of the unit. Ion recommends that replacement if points are bent, broken or otherwise damaged, or if you cannot remove dirt by cleaning the points with isopropanol alcohol. A replacement clip containing a pair of emitter points is available from Ion.

To replace the points:

1. Disconnect the power and air supplies.
2. Insert the tip of a screwdriver into the slot on the underside of the gun barrel. See **Figure 4. Replacing the Emitter Points.**

3. Using the screwdriver as a lever, loosen the old clip, then grasp it between your thumb and forefinger and detach it from the gun. The emitter points are very sharp. Handle carefully and only touch the plastic clip.

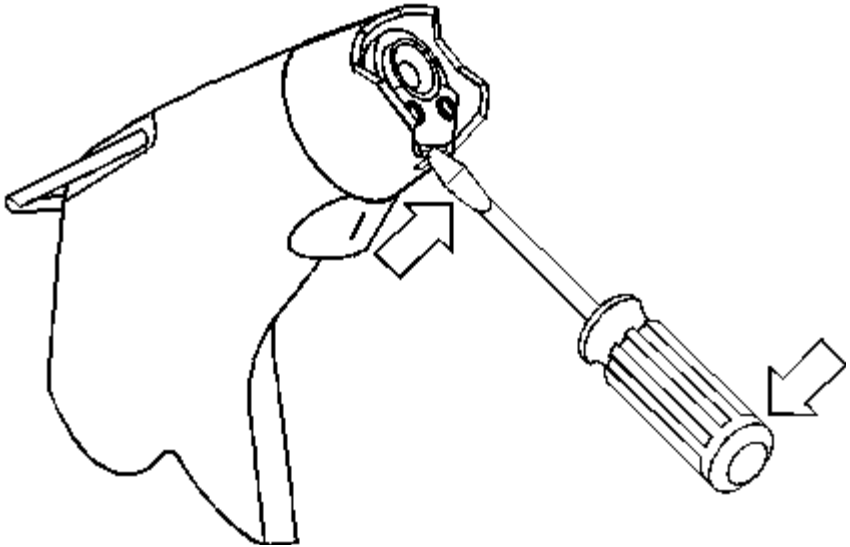


Figure 4. Replacing the Emitter Points

4. To insert the new clip, hold the gun with the barrel pointing up.
5. Grasp the new clip between your thumb and forefinger and align it so the curved edges of the clip match the curve of the inside of the gun barrel.
6. Align the blunt prongs of the emitters with the holes in the barrel and drop the clip into place.
7. Press the clip all the way in using the tip of a screwdriver. The clip should fit snugly between the raised rim of the barrel and the raised rim of the air nozzle. If the clip overlaps the air nozzle, it is installed backward.

## 5.4 Testing

To make sure your AirForce is working properly check the balance and discharge levels. Ion recommends periodic testing with a charged plate monitor such as Ion's Model 210 or Model 280.

Testing should be performed in accordance with the ionization standard S3.1-1991 of the ESD Association. At a line pressure of 30 psi, discharge of  $\pm 1000$  V to 100 V should require less than one second and balance should be within  $\pm 30$  V of zero.

Refer to the instruction manuals for the Model 210 or 280 for additional operating information.



# 6 Troubleshooting




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If no air is flowing through the AirForce gun when the trigger is activated, perform the following steps. If these steps do not eliminate the problem, contact Ion Technical Support. Do not attempt any repair other than that described below.

1. Check that the air supply is on.
2. Check that the air supply connection to the control console is secure.
3. Check the filter connection to the gun and hose.
4. Check the hose and filter connection to the console. Press the filter release button and push the filter fitting into the console until it is properly seated.


# 7 Specifications


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<b>6115 Airforce Gun</b>	
<b>Audible Noise</b>	70 dBA @ 1 meter, 30 psi
<b>Conducted EMI</b>	29 db $\mu$ V; Average level 100 KHz – 1.1 MHz
<b>Ozone</b>	< 0.005 ppm (24 hr. accumulation); Conforms to OSHA requirements
<b>Certifications</b>	  

<b>Hand Unit</b>	
<b>Construction</b>	Static-dissipative polycarbonate
<b>Ion Emission</b>	Steady-state DC
<b>Emitter points</b>	Machined titanium; field replaceable
<b>Ion Indicator</b>	Green LED
<b>Air Hose</b>	Static-dissipative polyurethane, 3/8" outside diameter; 7' (213.4 cm)/ 65 psi
<b>Gun Hanger</b>	302 stainless steel; optional mounting stand for hands-free operation
<b>Dimensions</b>	8.0" L x 3.0" W x 1.0" D (20.3 x 7.6 x 2.5 cm)
<b>Weight</b>	12.0 oz. (341 g) with 7' air hose



<b>14-1310 Wall Transformer</b>					
<b>Input characteristics</b>	Operating range: 117VAC $\pm$ 10%, 60Hz, 270mA				
<b>Output characteristics</b>	Voltage: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>No load</td> <td>V(max.): 29.0VAC</td> </tr> <tr> <td>Full load</td> <td>V(nom.): 24.0VAC <math>\pm</math>5%</td> </tr> </table>	No load	V(max.): 29.0VAC	Full load	V(nom.): 24.0VAC $\pm$ 5%
	No load	V(max.): 29.0VAC			
Full load	V(nom.): 24.0VAC $\pm$ 5%				
	Current: 0 - 1.0A				
<b>Temperature Range</b>	0 - 50 °C				
<b>Short Circuit Protection</b>	The power supply is provided with protection against short circuit by means of the primary thermal fuse.				
<b>Certification</b>					

<b>14-1523 Wall Transformer</b>					
<b>Input characteristics</b>	Operating range: 230VAC, 10%, 50/60Hz, 35W				
<b>Output characteristics</b>	Voltage: <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td>No load</td> <td>V(max.): 29.5VAC</td> </tr> <tr> <td>Full Load</td> <td>V(min.): 26.0VAC <math>\pm</math>5%</td> </tr> </table>	No load	V(max.): 29.5VAC	Full Load	V(min.): 26.0VAC $\pm$ 5%
	No load	V(max.): 29.5VAC			
Full Load	V(min.): 26.0VAC $\pm$ 5%				
	Current: 0 to 1.0A				
<b>Temperature Range</b>	0 - 50 °C				
<b>Short Circuit Protection</b>	The power supply is provided with protection against short circuit by means of the primary thermal fuse.				
<b>Certification</b>					

# 8 Replacement Part Numbers

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The following Ion part numbers are provided for replacement and optional parts for the AirForce.

<b>Air Filter</b>	91-6115FLT
<b>Emitter points</b>	91-6115EMT
<b>Footswitch</b>	91-6115SWT
<b>Model 210 Charged Plate Monitor (CPM)</b>	91-0210
<b>Model 280 Charged Plate Monitor (CPM)</b>	91-0280
<b>Model 210 CPM Instruction Manual</b>	19-0210-M
<b>Model 280 CPM Instruction Manual</b>	19-0280-M
<b>100VAC Wall Transformer</b>	14-1306
<b>117VAC Wall Transformer</b>	14-1310
<b>230VAC Wall Transformer</b>	14-1523

# 9 Warranty and Service

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Ion provides a limited warranty for the Model 6115 AirForce Ionizing Blow-off Gun. New products manufactured or sold by Ion are guaranteed to be free from defects in material or workmanship for a period of two (2) years from date of initial shipment. Ion's liability under its new product warranty is limited to servicing (evaluating, repairing, or replacing) any unit returned to Ion that has not been subjected to misuse, neglect, lack of routine maintenance, repair, alteration, or accident. In no event shall Ion be liable for collateral or consequential damages.

To obtain service under this warranty, please contact Ion Technical Support.

# About Ion

Ion, an ISO 9001 certified company provides electrostatic energy management solutions to help high-tech manufacturers develop and manage their electrostatics management programs for maximum yield, throughput and profitability. The company develops state-of-the-art technology, providing a wide range of products and services for a variety of applications - from cleanrooms to process equipment to electronics assembly areas. Ion was founded in 1978 and is headquartered in Berkeley, California, with operations worldwide. Its investors include Thomas Weisel Capital Partners, L.P. (TWCP), (<http://www.tweisel.com>). For more information about Ion call (800) 367-2452.

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